Small Business Innovation Research/Small Business Tech Transfer

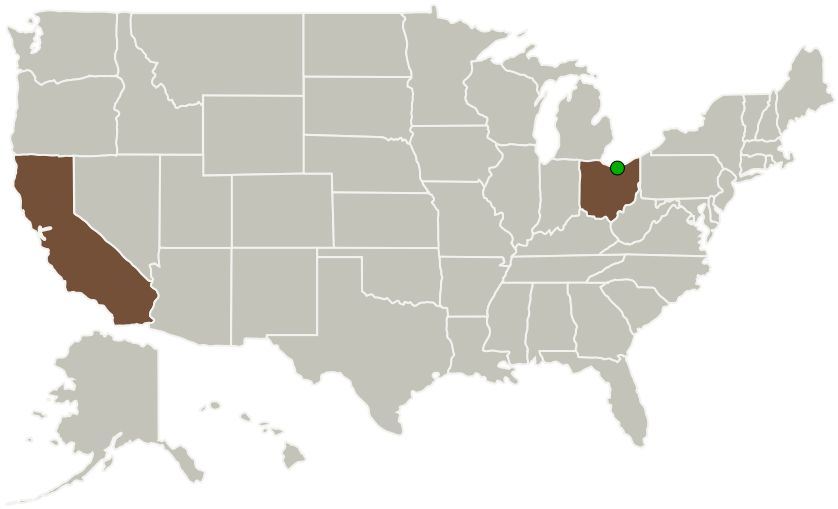
Multi-Layer Radiation Shields, Phase I

Completed Technology Project (2016 - 2016)

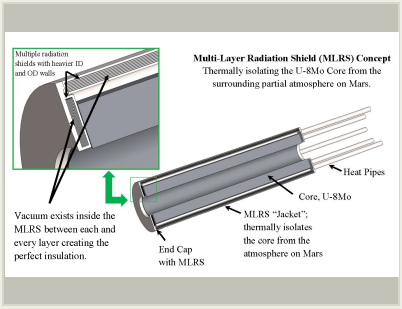
Project Introduction

Peregrine will develop a Multi-Layer Radiation Shield (MLRS) that will provide the equivalent insulation of a 30 layer 1.25 inch thick MLI blanket in the vacuum of space but on the surface of Mars. MLRS will provide superior properties to MLI but in a much smaller profile, MLRS can be accurately modeled and simulated so it is predictable, it can be pre-qualified, provide higher performance with no outgassing, and, when placed onto the exteriors of systems, can provide micrometeorite protection. The use of MLRS will, in a thin cross section, provide thermal isolation of the core of Fission Power Systems (FPS) to the environment of Mars. This will allow the FPS to operate at its intended design level; maintaining the heat within the core by creating a high performance insulation with an effective emissivity of less than 0.01 and an effective thermal conductivity of less than 0.005 W/mK.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
The Peregrine Falcon Corporation	Lead Organization	Industry	Pleasanton, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio



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Primary U.S. Work Locations	
California	Ohio

Project Transitions

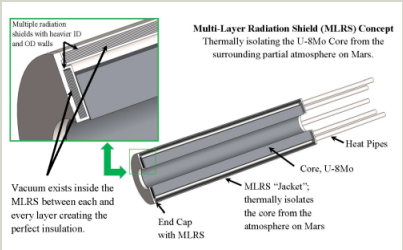
June 2016: Project Start

December 2016: Closed out

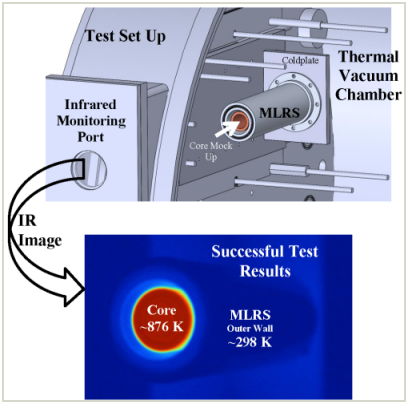
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139859)*

Images



Briefing Chart Image
Multi-Layer Radiation Shields, Phase I
(https://techport.nasa.gov/image/134169)



Final Summary Chart Image
Multi-Layer Radiation Shields, Phase I Project Image
(https://techport.nasa.gov/image/132285)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

The Peregrine Falcon Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

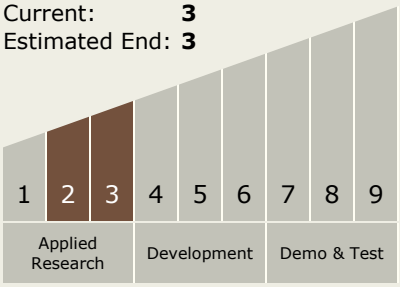
Carlos Torrez

Principal Investigator:

Robert Hardesty

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Completed Technology Project (2016 - 2016)

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System